

### 8.1.3 RHIZOBIA RESPONSE IN FABA BEANS (SYMMONS PLAINS, TAS)

#### Abstract:

Inoculation increased the number of nodules and nodule score of plants inoculated with RRI 294 and Type E rhizobia compared with other rhizobia strains and uninoculated plants. There were no yield differences between rhizobia inoculated plants and uninoculated plants.

#### Researchers:

Peter Johnson and Geoff Dean (TIAR)

**Acknowledgments:** Robert Howard (TIAR)

**Funding Organization:** GRDC

**Location:** Symmons Plains, Perth, Tasmania

**Growing Season Rainfall (April-Nov):** 387mm

#### Background/Objectives:

There is limited information to quantify the benefit of inoculating faba beans with rhizobia. In these trials the standard rate of type F rhizobia inoculum was compared with higher rates and different formulations, granular and dry. Two alternative rhizobia strains were also compared.

#### Methodology:

Faba beans were inoculated with type F rhizobia at standard rate, F-wet, or five times the standard rate, F-wet-Hi or with unwatered inoculum, F-dry. The granular "Alosca", type F, inoculum, type E inoculum and Rutherglen Research Institute inoculum (RRI 294) were also assessed against an uninoculated control. Alosca is a dry clay granule containing rhizobia that can be stored at room temperature. At mid flowering, 10 plants were dug up and roots were assessed for the number of nodules and nodulation score. Nodulation score is based on the number, location and activity of nodules on each plant.

**Sowing Date:** 14/05/04

**Rate:** 260 kg/ha

**Variety:** Fiesta VF

**Fertiliser:** 4:13:7:9

**Rate:** 250 kg/ha

**Weed Control 1:** Stomp

**Rate:** 2.5 l/ha

**Timing:** 18/5/04

**Weed Control 2:** Simazine

**Rate:** 2.5 l/ha **Timing:** 18/5/04

**Harvest date:** 14/01/05

#### Results and Discussion:

The RRI 294 strain had the greatest number of nodules and the highest nodule score (Table 1). A significant increase in the number of nodules and a higher nodule score was also found with the type E inoculum. There was a trend for F type inoculum to increase nodulation and nodule score though these were not significant. There were no significant effects of rhizobia inoculation on yields.

#### Conclusions:

Rhizobia type or rate had no effect on yields. However a small adjoining trial showed a trend to increased yield due to rhizobia inoculation when plants were stressed by waterlogging. This is in keeping with results from last year's trial where large differences between inoculated and uninoculated treatments were attributed to waterlogging stress in winter and spring. This year's trial was sown on raised beds. The absence of waterlogging stress and the release of nitrogen from stubble from the previous poppy crop may account for the lack of yield response to inoculation. Yields were high this year, with some adjoining irrigated plots reaching 7 t/ha.

**Table 1: Effects of Rhizobia Strain on Yield, Number of Nodules Per Plant and Nodule Score of Faba Beans.**

Rhizobia	Yield (t/ha)	Nodules per Plant	Nodule Score
F-wet	5.10	3.03	1.48
F-wet-Hi	5.27	3.01	1.62
F-Alosca	5.39	2.46	0.93
F-Dry	5.30	2.86	1.14
E-wet	5.21	3.31	1.69
RRI-294	5.17	4.41	2.49
Nil	5.11	2.19	0.94
<b>F prob</b>	<b>NS</b>	<b>0.013</b>	<b>0.002</b>
<b>s.e.d.</b>	<b>0.522</b>	<b>0.542</b>	<b>0.336</b>